

## ABSTRACT

A decoding apparatus that is capable of calculating of the likelihood information at high speed while suppressing increases in processing amount and in circuit scale. In this apparatus, in computations of the backward probability in a backward probability computing section (112), while one processing system calculates the backward probability  $\beta_k$  from the backward probability  $\beta_{k+2}$ , the other processing system calculates the backward probability  $\beta_{k-1}$  from the backward probability  $\beta_{k+1}$  in parallel. Specifically considering the case of  $k=1$ , backward probabilities  $\beta_1$  and  $\beta_0$  are calculated in parallel in two processing systems. The calculated backward probabilities are stored in a storage section (114) on a window basis. Further, as in the backward probability, in a forward probability computing section (113), forward probabilities  $\alpha_k$  and  $\alpha_{k+1}$  are calculated in parallel in two processing systems. When the forward probabilities are calculated, a likelihood computing section (115) calculates the likelihood information using the forward probabilities and backward probabilities stored in storage section 114.

FIG.2 FIG.5 FIG.6

TRAINING PERIOD

FIG.3

5 100 120 INTERLEAVER  
 110 130 DECODER  
 140 150 DEINTERLEAVER  
 160 HARD DECISION SECTION  
 170 ERROR DETECTING SECTION  
 10 DECODED DATA

FIG.4

111 TRANSITION PROBABILITY COMPUTING SECTION  
 112 BACKWARD PROBABILITY COMPUTING SECTION  
 15 113 FORWARD PROBABILITY COMPUTING SECTION  
 114 STORAGE SECTION  
 115 LIKELIHOOD COMPUTING SECTION  
 LIKELIHOOD INFORMATION